Chemistry of a substance mainly deals with the chemical behaviour of the substance and the correlation between the observations and its structure. The amphoteric nature of wool keratin has been an interesting field for a number of years. The sorption of acids, dyes and inorganic electrolytes by wool keratin gave rise to different theories viz. Gilbert-Rideal Theory, Generalized Donnan Theory and Polyelectrolyte Theory. The effects of different anions and cations were studied in the light of these theories.

Though, the combination of polyvalent metal ions has been reported by many investigators, little progress has been made in terms of quantitative analysis. In the present study, the absorptions of bivalent metal ions, viz., cupric and zinc ions, were studied in detail. The study was extended to observe the effects of these salt solutions on set/supercontraction, load-extension behaviour, reflectance spectra and X-ray diffraction patterns.

The work carried out consists of:

1. Distribution and the mode of interaction of ions from sodium chloride, zinc chloride and cupric chloride in
the wool fibre and the effect of (a) pH, (b) concentration at pH 4 and (c) temperature (30°C, 40°C and 50°C).

2. Load-extension curves of cupric chloride treated fibres.

3. X-ray diffraction of untreated, zinc chloride and cupric chloride treated fibres.

4. Reflectance spectra of wool fibres treated with cupric chloride solutions at different pH values.

5. Set/supercontraction characteristics of untreated and cupric chloride treated wool, at boil, in the solutions of (pK-H-phthalate, Borax, sodium bisulphite, sodium sulphite and periodic acid.)